

Water, water everywhere

The growth of the plastic water bottle market is increasing the pressure on the recycling industry to improve plastics recovery efforts and expand container deposit legislation.

by Pat Franklin

Water, the oldest liquid on earth, is the biggest selling, fastest growing new-age drink on the market. Packaged almost exclusively in plastic bottles made of polyethylene terephthalate (PET), the ubiquitous water bottle has experienced unprecedented growth during the past decade. Package sizes range from six ounces to five gallons, but 90 percent of water is sold in single-serving bottles of less than one liter.

Health-conscious Americans consume water from disposable plastic bottles at a rate of more than 78 million bottles per day. For most consumers, bottled water simply provides an opportunity to hydrate on the go, wherever they go.

While carbonated soft drinks (CSD) remain the top selling packaged beverage, sales of CSDs in single-serving plastic bottles were surpassed by bottled water in 2004. By 2005, bottled water sales had grown to nearly 27 billion containers, while soda bottle sales were just under 19 billion. At current growth rates, twice as many single-serving plastic water bottles will be on the market as carbonated soft drink bottles in 2007 – 39 billion versus 19 billion (see Figure 1).

Initially, bottled water was sold individually in convenience stores and vending machines, but today it can be purchased by the case in grocery outlets and big-box stores, such as Wal-Mart, Sam's Club (both of Ben

a trash can than a recycling bin.

The price we pay to hydrate

Most Americans pay a monthly water bill for municipal tap water, at an average cost of \$2 per 1,000 gallons (a fraction of a cent per gallon), according to the American Water Works Association (Denver). Filtering tap water by means of a device installed under the kitchen sink brings the cost up to about \$0.10 per gallon, and a tabletop filter increases the cost to \$0.25 per gallon.

Bottled water, on the other hand, can cost as much as 10,000 times more than tap water, according to the AWWA. But the price consumers are paying for the bottled water itself pales in comparison to the price paid for the environmental consequences of drilling oil, manufacturing and transporting new bottles, and the disposal of used bottles.

The Earth Policy Institute (Washington) estimates that making bottles to meet the U.S. demand for bottled water requires more than 1.5 million barrels of oil annually, enough to

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tonville, Arkansas) and Costco (Issaquah, Washington). Even though they are purchased in bulk and taken home, bottled water in sizes less than one liter are generally drained away from home, and are more likely to end up in

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fuel 100,000 cars for a year. Transport and disposal of the bottles adds to the resources used, and water extraction – which is concentrated in communities where bottling plants are located – adds to the strains bottled water puts on our ecosystem.

Plastic water bottle waste has mushroomed

Unprecedented growth in U.S. bottled water sales is matched by unprecedented growth in plastic bottle waste. The number of single-serving plastic water bottles wasted (not recycled) has mushroomed from an estimated 2.3 billion in 1995 to more than 22 billion in 2005 – a 900-percent increase in just 10 years. By the end of 2007, more than 100 billion plastic water bottles will have been sent to landfills and incinerators in just the past five years (see Figure 2).

Lacking published recycling data for water bottles, these figures are arrived at by assuming that PET water bottles are recycled at the same rate as custom PET bottles. It is known that CSDs are recycled at rates more than twice the rate of PET custom bottles, because for 15 years the American Plastics Council, now the American Chemistry Council (Washington), broke out the annual PET sales and recycling data into two categories: CSD and custom PET. The ACC discontinued this practice in their 2005 report, but since the volume of CSD bottles sold declined and bottles recycled increased in 2004 – resulting in an increase in the 2004 recycling rate – it seems safe to use the 2004 recycling data in determining the CSD recycling rate for 2005.

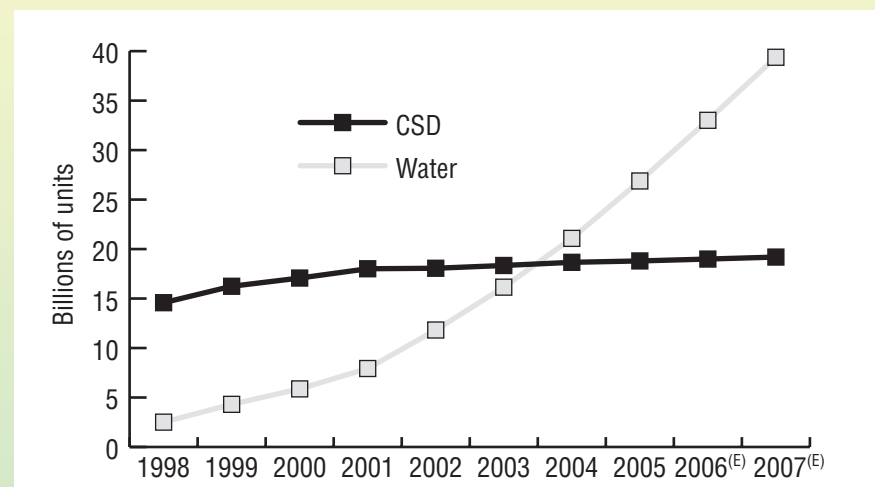
According to the ACC, the 2004 recycling rate was 33.7 percent for CSD and 14.5 percent for PET custom bottles. CSD PET enjoys a higher recycling rate than custom PET, because plastic soda bottles that require a refundable deposit in 11 states are recycled at rates ranging from 45 percent in California, where the 2005 refund value was four cents each (it was changed to five cents in January 2006) to 95 percent in Michigan, where the refund value is a dime. In the other nine states where the refund value is a nickel, the redemption rate ranges from 68 percent to 80 percent, but the recycling rate is higher when containers recycled through curbside programs are included.

The 2005 custom PET bottle data can be derived using the 2004 CSD sales and recycling data, as well as 2005 data for all PET bottles. Under these assumptions, the recycling rate in 2005 for PET water bottles was 17.6 percent (see Table 1).

Stem the growing tide

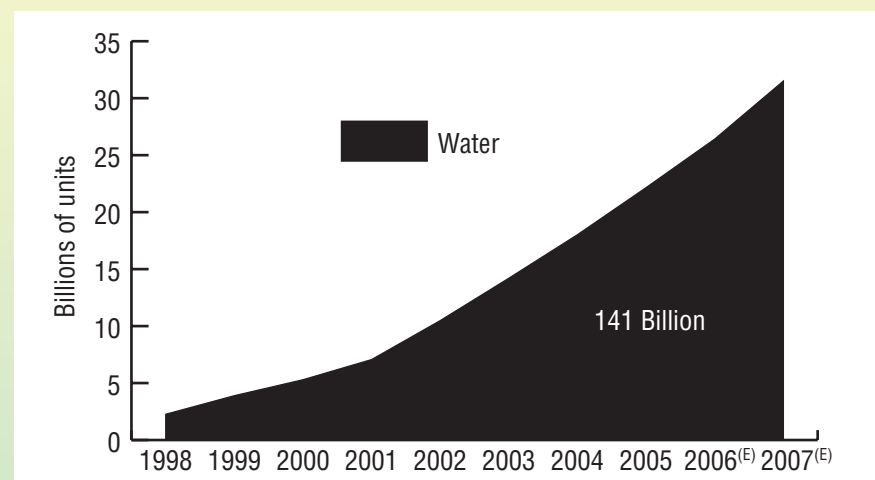
This year, assuming the water bottle recycling rate moves up a couple of percentage points, close to 20 percent of the plastic water bottles sold will be recycled, while the other 80

Figure 1 Growth in plastic water bottle sales: 1998-2007



(E) Estimated.
Source: Beverage Marketing Corp., 2006.

Figure 2 Plastic water bottle waste: 1998-2007



(E) Estimated.
Source: Beverage Marketing Corp., 2006.

percent will be trashed. These numbers could be reversed within two years with a national law requiring refundable deposits on all bottled water. Plastic soda bottles are being redeemed at around 70 percent in most states with a nickel deposit. Another 10 percent or more are being recycled through curbside recycling programs in those states; there you have it, 80-percent recycling and 20-percent wasting.

But do lawmakers have the political will to pass laws that would guarantee such a reversal? Connecticut, Massachusetts, New York and Oregon are considering legislation that would update the deposit laws to include bottled water, which did not exist when the orig-

inal laws were passed. If all four states were to put a nickel deposit on water bottles, the amount of scrap PET available to reclaimers would grow by an estimated 100 million pounds.

Still more can be done to reduce plastic bottle waste. States could pass laws requiring bottled water producers to use recycled content in their plastic bottles. According to the National Association for PET Container Resources (Sonoma, California), six of the twelve plastic bottle reclamation plants in the U.S. have received letters of non-objection from the federal Food and Drug Administration (Washington), allowing the RPET produced to be used in direct contact with vari-

ous food and beverage products, yet only a fraction of PET bottles sold (less than three percent) are used to make new plastic bottles.

The paucity of closed-loop recycling means that new water bottles must be manufactured almost entirely from virgin petroleum resin, consuming vast amounts of energy and resources. Increasing the quantity of bottles containing recycled content would greatly reduce energy usage, greenhouse gas emissions and pollution.

Two years ago, the Coca-Cola Co. (Atlanta) committed to using recycled content in 10 percent of all its plastic beverage bottles sold in North America. Soon after, PepsiCo (Purchase, New York) committed to using 10-percent recycled content in its plastic soft drink and water bottles sold in the U.S. Although both Coke and Pepsi met their recycled content goals in 2005, Coke has withdrawn its commitment. Other bottled water producers are silent on the issue.

The broken link: Collection infrastructure

Not only energy and material resources are being wasted when PET bottles are not recycled, but the opportunities to grow businesses also are lost – homegrown businesses, businesses that convert scrap PET bottles into clean flake and businesses that convert clean flake into strapping, carpet, new bottles and other recycled products.

Unfortunately, with the current infrastructure for collecting PET bottles – container deposit systems in 11 states, 9,000 curbside programs and thousands of drop-off centers – fewer than one in five PET water bottles are being collected. The broken link between post-consumer PET bottles and plastics processors is the lack of an adequate

Table 1 PET bottle recovery rate (in percent)

PET bottles	2004	2005
CSD	33.6	33.6 ^(E)
Custom	14.5	21.6 ^(E)
All bottles	21.6	23.1

(E) Estimated percentage.
Source: American Plastics Council, 2006.

collection infrastructure.

First, nearly half of the U.S. population does not have access to curbside recycling and probably never will. These include individuals and families who live in very rural areas or in apartment buildings. Even in communities served by a curbside program, not everyone participates.

But even if every family in America had access to curbside recycling and participated, water bottles are much more likely to be consumed in hotels, offices, schools, during sporting events and at outdoor activities. Thus, this material would not likely make it into the curbside bin. Container recycling in commercial buildings is scarce, and recycling at sports, entertainment venues, parks and beach areas has proven extremely challenging.

Plastic water bottle waste: A national disgrace

More than 30 billion plastic water bottles will be landfilled or incinerated in the U.S. this year. Hundreds of millions more will clog the streams and tributaries feeding America's rivers. Bottles not contained by fallen trees and other debris along our inland waterways will float out into the Atlantic and Pacific Oceans.

Further information

Bottled Water: Pure Drink or Pure Hype, Natural Resources Defense Council

www.nrdc.org/water/drinking/bw/bwinx.asp

Plastic Water Bottle Waste

www.container-recycling.org/plasfact/drinkingwater.htm

Sierra Club's Bottled Water Campaign

www.sierraclub.org/cac/water/bottled_water/

Water Rights Project

www.polarisinstitute.org/polaris_project/water_lords/water_lords_index.html

Water, Water Everywhere: The Growth of Non-Carbonated Beverages in the U.S.

www.container-recycling.org/assets/pdfs/reports/2007-waterwater.pdf

Plastic bottle waste is not just a national problem, it is a national disgrace. Without a nationwide system of deposits, expansion of existing deposit laws, and some new collection infrastructure efforts, America faces a growing mountain of plastic bottle waste with all of the resulting social and environmental consequences. **RR**

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